

**REMARKS**

This supplements the discussion of the how distribution of air over the top surface of the paddle creates a second vacuum zone around the periphery of the paddle as clearly illustrated in Fig. 4 and described in detail in the Specification. The Examiner witnessed this phenomena at a demonstration by Applicant's attorney at an Interview with the Examiner sometime ago.

Enclosed are excerpts from technical journals which describe the lift effect of passing air over the top surface of a strip of paper creating a vacuum on the lower face and thus results in a lift force at the free end.

Applicant's disclosure clearly shows and describes how a portion of air drawn by the impeller is directed over the top surface of the paddle to create the secondary lift force.

The Examiner acknowledges that the application clearly makes this disclosure. See Examiner quote from second paragraph, page 4:

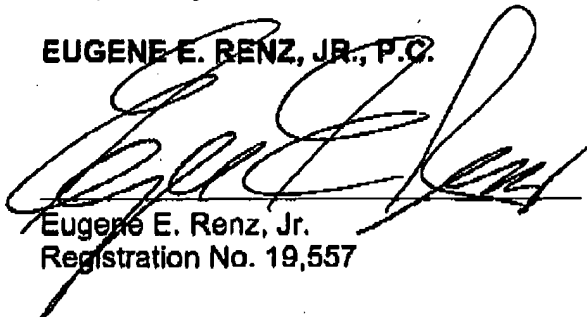
*The impeller then distributes direct air over the top surface which creates a second vacuum zone at the periphery of the paddle to provide the force necessary to support the wafer over its entire face.*

The fact that the Examiner does not agree with the principle is not support for a rejection under 35 U.S.C. §112, first paragraph, the disclosure is clear and simple to the point that a person skilled in this art could practice the invention. The disclosure shows and describes how to draw air through an opening in the paddle from below and direct some of the air over the top surface (See Fig. 4).

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. §112. If there are additional matters which require attention, Applicant's attorney respectfully requests the Examiner to call him by phone and thereby expedite prosecution of this case.

Respectfully submitted,

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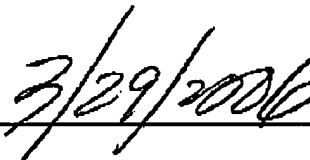
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# **Popular Delusions about Bernoulli's Principle**

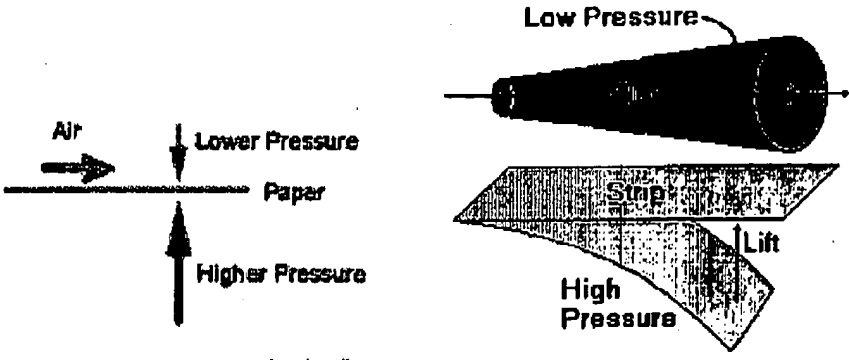
## **Demonstrations Illustrate Radial Momentum Instead**

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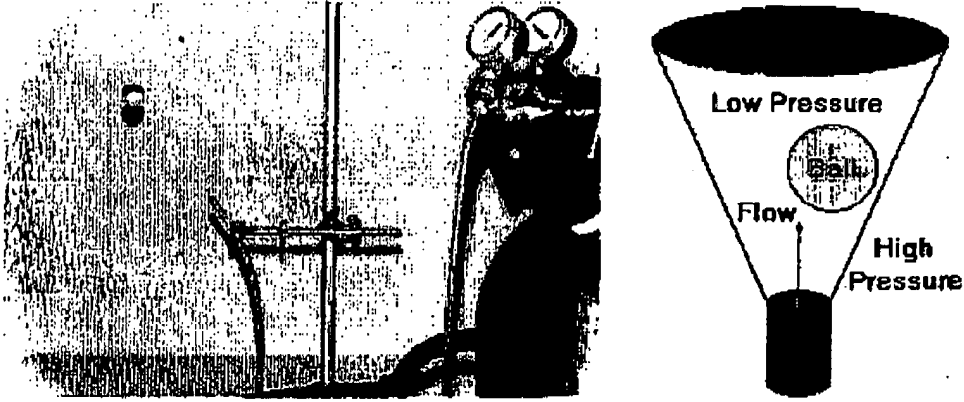
Textbooks and Internet Bernoulli sites present many experiments to demonstrate Bernoulli's Principle. These experiments rarely demonstrate Bernoulli's Principle at all. They demonstrate Radial Momentum.

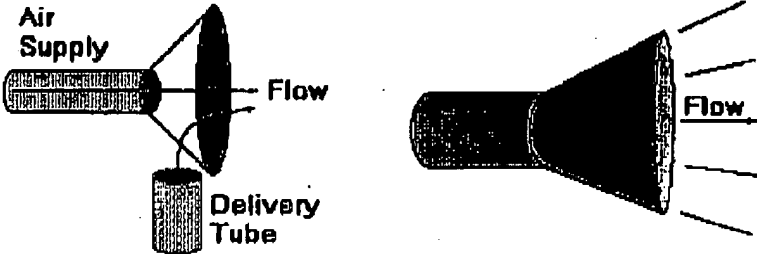
As high school students must learn, the standard explanation for lift is Bernoulli's Principle; high velocity means low pressure. While Bernoulli's Principle is fundamentally correct, the application of it to explain lift is fundamentally incorrect. The real principle behind lift is Radial Momentum. Ironically, Bernoulli's principle does not even explain the devices commonly used to demonstrate the Bernoulli Principle itself.

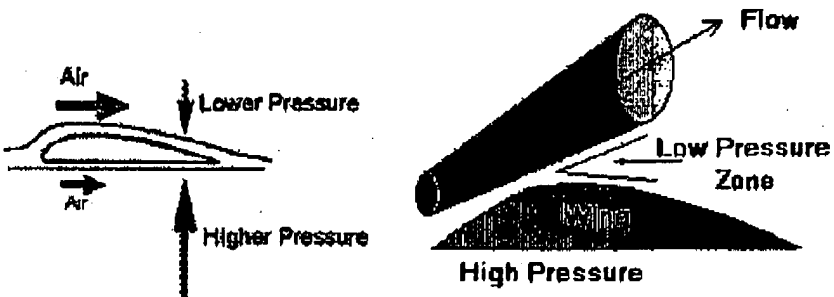
Bernoulli's Principle does not explain the experimental observations, particularly those differentiating between radial flow and non-radial flow in open systems with flow motivation. Bernoulli's Principle is widely misapplied. Ironically, Bernoulli's Principle does not explain the experiments commonly used to demonstrate the Bernoulli Principle.

Flying Paper	
<p>Note: This experiment comes, complete with Bernoulli misapplication, from <u>NASA</u>.</p>	<p><b>Flying Paper</b></p> <p><b>Materials:</b> 2" x 8" strip of paper &amp; paper clips</p> <p><b>Experiment:</b> Place the strip of paper so that one end is resting just under your lower lip and the other end is hanging down. Holding it in place, blow over the top of the paper. The end of the strip of paper hanging down will lift up so that it is "flying." Try placing paper clips on the hanging end of the paper and see if it has enough lift to overcome their weight.</p> <p><b>Explanation:</b> With the increased air speed over the top of the paper, the air pressure over the top of the paper is decreased (Bernoulli's Principle). This makes it so that the paper has higher air pressure underneath it, lifting it into the air.</p>
Bernoulli	Faster flowing air over the top of the strip of paper causes lift and the paper rises
Radial Momentum	<p>I hold a strip of paper against my bottom lip and blow air across the top. Radial Momentum induces a region of low pressure above the strip and the higher pressure under the strip elevates it.</p>

The Radial Momentum theory explains all of the experimental observations of pressure decrease in open systems with flow motivation. It explains atomizers, airfoils, airplanes, curve balls, lift, cavitation, eddy currents and a full range of behavior involving pressure decrease.

<b>Floating Tennis Ball</b>	
<b>Bernoulli</b>	<p>Faster air inside the cone keeps the ball inside the cone</p>
<b>Radial Momentum</b>	<p>The effluent stream from a vacuum cleaner is seen to hold a ball aloft, even if the air stream is tilted somewhat off true vertical, in which case the ball may spin rapidly. Radial Momentum induces a region of low pressure inside the cone that keeps the ball inside the cone. Higher velocity at the center of the cone spins the ball.</p>

<b>Atomizer</b>	
<b>Bernoulli</b>	<p>Faster air over the nozzle sucks the perfume up the tube.</p>
<b>Radial Momentum</b>	<p>In a perfume atomizer, the air supply from a squeeze ball, flows over a delivery tube. Radial Momentum induces a cone of low pressure that acts to elevate the perfume into the flow. Atomizers work with an air supply (that expands radially) and do not work with a liquid supply (that does not). An atomizer nozzle that entrains flat and expanding flow is more efficient.</p>

Airplane Wing	
Bernoulli	<p style="text-align: center;"><b>Classic Misconception</b></p> <p>This wing cross-section diagram appears in numerous textbooks and on countless web sites</p> <p>It accompanies the claim that Bernoulli's Principle explains lift, in terms of higher velocity over the top of the wing causing lower pressure.</p> <p>Does Bernoulli's Principle explain lift? Not at all! The real reason for lift (aside from angle of attack) is Radial Momentum. The classic drawing to the left is inapplicable to lift and is downright misleading.</p> <p>Faster air over the top of the wing induces lift. The airplane wing receives extensive misapplication of Bernoulli's Principle to explain lift as a function of high air velocity. This is simply not the case; Radial Momentum, not velocity, induces low pressure. To try to make Bernoulli's Principle work, the literature is replete with a wide range of rather inventive add-ons, patches and upgrades such as circulation and induced lift. These rely on unsupported hypotheses about the behavior of air such as (1) air circulates around a wing against the wind and (2) air speeds up to reunify with partner molecules separated by the leading edge of the wing.</p>
Radial Momentum	<p>An airplane wing may develop a cone of Radial Momentum over the shoulder of the wing. The lower pressure may induce eddy currents, cavitation, separation and turbulence. Lift is primarily a function of angle of attack, not of so-called Bernoulli lift or synthetic circulation. The main effect of curvature is to entrain laminar flow, reduce turbulence, and conserve energy which indirectly contributes to lift.</p> <p><b>Radial Momentum ... The Real Explanation</b></p> <p>Air, striking the front of the wing, deflects upward, actually pushing the front of the wing down. It then continues upward by momentum. When it encounters the curvature on the top of the wing, it fans out. This results in lower air density, and lower pressure ... however, this effect occurs only behind the crest of the wing ... and it has very little to do with lift.</p> <p>In actual practice, the net effect of wing curvature on lift is small; most of the lift comes from angle of attack; the curvature mostly helps train the air off the back edge of the wing ... so that less energy disappears into turbulence and more energy goes to propulsion.</p> <p><b>Airplane Wings</b></p> <p>Airplane wings do not need to be curved on top to create lift. Lift has to do with the angle of attack as you can easily verify with your hand out a car window. The curvature of a wing is useful, however, in training the flow of air around the wing so it remains laminar and does not become turbulent at the trailing edge. Laminar flow is more</p>

efficient and conserves power. In this way, it provides more net power to the wing and hence, more power to lift the plane. It also provides more net power to the bathroom lights. So in that regard, curved wings also cause more photons.

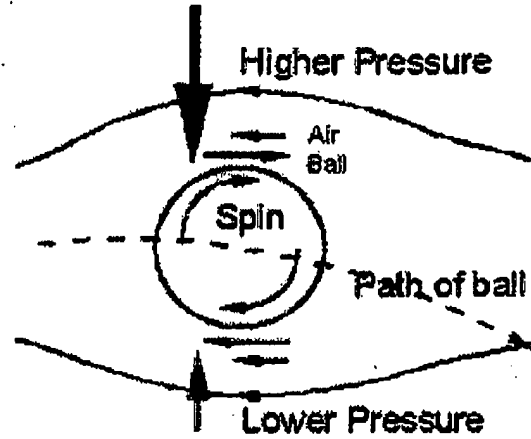
Balsa wood gliders work very well with flat, warped and twisty wings. Some helicopter blades have equal curvature on both sides. Some planes have flat wings. Some planes fly upside-down. This all indicates that wings do not need humpy curvature to have lift.

To the extent that a wing has a curvature, the leading edge has a downward angle of attack and the trailing edge has an upward angle of attack. This creates a net forward rolling torque. In effect, an airplane with a curved wing would like to roll forwards and fly forward with the nose down, with the curved part of the wing into the wind.

Still, some scientists hold on to the notion of curvature = lift. Some even add curious theoretical patches to, well, to try to make it fly better. These include the principle of equal transit times, starting vortex, induction, circulation, and induced angle of attack. Gale M. Craig has a nice web site documenting induced induction and circulation of crazy theories.

#### Turbulence

Turbulence, an effect observed at high Reynolds numbers, may be induced by Radial Momentum. For example, the cone of vacuum induced at the shoulder of an airplane wing can induce eddy currents and provoke turbulence.

Baseball	 <p>The diagram illustrates the forces on a baseball. A central circle represents the ball with a curved arrow labeled 'Spin' indicating clockwise rotation. Horizontal arrows labeled 'Air Ball' show air flow from left to right. A dashed line labeled 'Path of ball' curves downwards from left to right. At the top, a downward arrow points to the ball with the label 'Higher Pressure'. At the bottom, an upward arrow points away from the ball with the label 'Lower Pressure'.</p>
Bernoulli	<p>The spin of the ball creates a relatively faster air flow over the top. Therefore the ball is supposed to rise ... actually it falls.</p>
Radial Momentum	<p>The spin of the ball sets up a small region of Radial Momentum at about 7:00 on the diagram ... this pulls the ball downward. The spin also creates a pressure front at about 1:00 and this also acts to push the ball downward.</p>



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